WHAT IS CLAIMED IS:

1. A packet transmission method for transmitting packets classified according to a quality of service (QoS) requirement from a transmitting node to a receiving node, the packet transmission method comprising the steps of:

in the transmitting node,

selecting sequentially a QoS class;

dividing a queued packet to be transmitted belonging to the selected class into a plurality of predetermined data units, and transmitting one of the predetermined data units; and

applying a transmitter-side retransmission control process to the data unit to be transmitted when the selected class is a QoS class specified for data type packets;

in the receiving node,

receiving sequentially the data unit transmitted from the transmitting node;

applying a receiver-side retransmission control process to the received data unit to be assembled when the received data unit belongs to one of the QoS classes specified for the data type packets; and

assembling a plurality of received data units to decompress the original packet in each QoS class.

2. The packet transmission method as claimed in claim 1, wherein:

the queued packet to be transmitted is divided into a plurality of the data units only when there is no data unit which is not yet transmitted

and belongs to the same QoS class as the queued packet to be transmitted.

3. The packet transmission method as claimed in claim 1, wherein:

the queued packet to be transmitted is divided into a plurality of the data units and stored; and

one of the data units belonging to the selected class from the stored data units is transmitted.

4. The packet transmission method as claimed in claim 1, wherein:

the transmitting node applies a header compression process to the queued packet to be transmitted in a predetermined manner, and divides the header-compressed packet into a plurality of the predetermined data units; and

the receiving node applies to the assembled packet a header decompression process corresponding to the header compression process.

5. The packet transmission method as claimed in claim 2, wherein:

the transmitting node applies a header compression process to the queued packet to be transmitted in a predetermined manner, and divides

the header-compressed packet into a plurality of the predetermined data units; and

the receiving node applies to the assembled packet a header decompression process corresponding to the header compression process.

6. The packet transmission method as claimed in claim 3, wherein:

the transmitting node applies a header compression process to the queued packet to be transmitted in a predetermined manner, and divides the header-compressed packet into a plurality of the predetermined data units; and

the receiving node applies to the assembled packet a header decompression process corresponding to the header compression process.

7. A packet transmission system for transmitting packets classified according to a QoS requirement from a transmitting node to a receiving node, wherein,

the transmitting node comprises:

a dividing part provided for each of QoS classes for dividing a packet to be transmitted into a plurality of predetermined data units in each of QoS classes;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process in each QoS class to the data unit that belongs to one of QoS classes specified for data type packets and is one of the data units

obtained from the dividing part; and

a scheduling part for selecting a data unit to be transmitted from a set of data units including a data unit that belongs to one of QoS classes not specified for data type packets and is obtained from the dividing part, and a data unit that belongs to one of the QoS classes specified for data type packets and is obtained from the transmitter-side retransmission control part, and transmitting the selected data unit, and

the receiving node comprises:

a receiver-side retransmission control part for applying a receiver-side retransmission control process in each QoS class to the data unit that belongs to one of the QoS classes specified for data type packets and is one of the received data units;

an assembling part for assembling in each QoS class the data units that belong to one of the QoS classes not specified for data type packets and are some of the received data units, and the data units that belong to one of the QoS classes specified for data type packets and are obtained from the receiver-side retransmission control part to decompress the original packet.

8. The packet transmission system as claimed in claim 7, wherein:

the transmitting node further comprises a header compressing part for applying a header compression process in a predetermined manner to the packet to be transmitted;

the receiving node further comprises a header decompression part;

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units;

the assembling part applies the assembling process to the plurality of the predetermined data units to decompress the header-compressed packet; and

the header decompression part applies a header decompression process corresponding to the header compression process in the header compressing part to the header-compressed packet obtained from the assembling part to decompress the original packet.

9. A packet transmission system for transmitting packets classified according to a QoS requirement from a transmitting node to a receiving node, wherein,

the transmitting node comprises:

a first pre-scheduling part for selecting classes having high priority for transmission from QoS classes specified for data type packets;

a second pre-scheduling part for selecting classes having high priority for transmission from QoS classes not specified for data type packets;

a first dividing part for dividing a queued packet to be transmitted belonging to the QoS class selected by the first pre-scheduling part into a plurality of predetermined data units;

a second dividing part for dividing a queued packet to be transmitted belonging to the QoS class selected by the second pre-scheduling part into a plurality of the predetermined data units;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process to the packet to be transmitted to be divided by the first dividing part; and

a scheduling part for selecting either one of the QoS classes specified for data type packets or one of the QoS classes not specified for data type packets to be transmitted, transmitting the data unit obtained from the transmitter-side retransmission control part when the QoS class specified for data type packets is selected, and transmitting the data unit obtained from the second dividing part when the QoS class not specified for data type packets is selected, and

the receiving node comprises:

a receiver-side retransmission control part for applying a receiver-side retransmission control process in each QoS class to the data unit that belongs to one of the QoS classes specified for data type packets and is one of the received data units; and

an assembling part for assembling the data units that belong to one of the QoS classes not specified for data type packets and are some of the received data units, and the data units that belong to one of the QoS classes specified for data type packets and are obtained from the receiver-side retransmission control part in each QoS class to decompress the original packet.

10. The packet transmission system as claimed in claim 9, wherein:

the transmitting node further comprises a header compressing part for applying a header

compression process in a predetermined manner to the packet to be transmitted;

the receiving node further comprises a header decompression part;

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units;

the assembling part applies the assembling process to the plurality of the predetermined data units to decompress the header-compressed packet; and

the header decompression part applies a header decompression process corresponding to the header compression process in the header compressing part to the header-compressed packet obtained from the assembling part to decompress the original packet.

11. A packet transmission system for transmitting packets classified according to a QoS requirement from a transmitting node to a receiving node, wherein,

the transmitting node comprises:

a first scheduling part for determining transmission order for packets to be transmitted;

a dividing part provided for each QoS class for dividing the packet to be transmitted of which transmission order is determined by the first scheduling part into a plurality of predetermined data units in each QoS class;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process in each QoS class to the data unit

that belongs to one of QoS classes specified for data type packets and is one of the data units obtained from the dividing part; and

a scheduling part for selecting a data unit to be transmitted from a set of data units including a data unit that belongs to one of QoS classes not specified for data type packets and is obtained from the dividing part, and a data unit that belongs to one of the QoS classes specified for data type packets and is obtained from the transmitter-side retransmission control part, and transmitting the selected data unit, and

the receiving node comprises:

a receiver-side retransmission control part for applying a receiver-side retransmission control process in each QoS class to the data unit that belongs to one of the QoS classes specified for data type packets and is one of the received data units;

an assembling part for assembling in each QoS class the data units that belong to one of the QoS classes not specified for data type packets and are some of the received data units, and the data units that belong to one of the QoS classes specified for data type packets and are obtained from the receiver-side retransmission control part to decompress the original packet.

12. The packet transmission system as claimed in claim 11, wherein:

the transmitting node further comprises a header compressing part for applying a header compression process in a predetermined manner to the packet to be transmitted;

the receiving node further comprises a header decompression part;

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units;

the assembling part applies the assembling process to the plurality of the predetermined data units to decompress the header-compressed packet; and

the header decompression part applies a header decompression process corresponding to the header compression process in the header compressing part to the header-compressed packet obtained from the assembling part to decompress the original packet.

13. A packet transmitting/receiving apparatus comprising a transmitting part and a receiving part for transmitting and receiving packets classified according to a QoS requirement respectively, wherein,

the transmitting part comprises:

a dividing part provided for each QoS class for dividing a packet to be transmitted into a plurality of predetermined data units in each QoS class;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process in each QoS class to the data unit that belongs to one of QoS classes specified for data type packets and is one of the data units obtained from the dividing part; and

a scheduling part for selecting a data

unit to be transmitted from a set of data units including a data unit that belongs to one of QoS classes not specified for data type packets and is obtained from the dividing part, and a data unit that belongs to one of the QoS classes specified for data type packets and is obtained from the transmitter-side retransmission control part, and transmitting the selected data unit,

the receiving part comprises:

a receiver-side retransmission control part for applying a receiver-side retransmission control process in each QoS class to the data unit that belongs to one of the QoS classes specified for data type packets and is one of the received data units;

an assembling part for assembling in each of QoS classes the data units that belong to one of the QoS classes not specified for data type packets and are some of the received data units, and the data units that belong to one of the QoS classes specified for data type packets and are obtained from the receiver-side retransmission control part to decompress the original packet,

the receiver-side retransmission control part generates a retransmission request control signal to indicate a data unit requested to be retransmitted to another packet transmitting/receiving apparatus communicating with the packet transmitting/receiving apparatus,

the scheduling part performs a scheduling process on the retransmission request control signals with the data unit to be transmitted,

the transmitting part further comprises:

a classifying part for classifying and outputting the retransmission request control signals transmitted from the opposing packet transmitting/receiving apparatus into the

transmitter-side retransmission control part, and

the transmitter-side retransmission control part outputs to the scheduling part the data unit indicated by the retransmission request control signal transmitted from the opposing packet transmitting/receiving apparatus upon the retransmission request control signal being input.

14. The packet transmitting/receiving apparatus as claimed in claim 13, wherein:

the transmitting part further comprises a header compressing part for applying a header compression process in a predetermined manner to the packet to be transmitted;

the receiving part further comprises a header decompression part;

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units;

the assembling part applies the assembling process to the plurality of the predetermined data units to decompress the header-compressed packet; and

the header decompression part applies a header decompression process corresponding to the header compression process in the header compressing part to the header-compressed packet obtained from the assembling part to decompress the original packet.

15. A packet transmitting/receiving apparatus comprising a transmitting part and a receiving part for transmitting and receiving packets classified according to a QoS requirement respectively, wherein,

the transmitting part comprises:

a first pre-scheduling part for selecting classes having high priority for transmission from QoS classes specified for data type packets;

a second pre-scheduling part for selecting classes having high priority for transmission from QoS classes not specified for data type packets;

a first dividing part for dividing a queued packet to be transmitted belonging to the QoS class selected by the first pre-scheduling part into a plurality of predetermined data units;

a second dividing part for dividing a queued packet to be transmitted belonging to the QoS class selected by the second pre-scheduling part into a plurality of the predetermined data units;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process to the packet to be transmitted to be divided by the first dividing part; and

a scheduling part for selecting either one of the QoS classes specified for data type packets or one of the QoS classes not specified for data type packets to be transmitted, transmitting the data unit obtained from the transmitter-side retransmission control part when the QoS class specified for data type packets is selected, and transmitting the data unit obtained from the second dividing part when the QoS class not specified for data type packets is selected, and

the receiving node comprises:

a receiver-side retransmission control part for applying a receiver-side retransmission

control process in each QoS class to the data unit that belongs to one of the QoS classes specified for data type packets and is one of the received data units;

an assembling part for assembling in each QoS class the data units that belong to one of the QoS class not specified for data type packets and are some of the received data units, and the data units that belong to one of the QoS classes specified for data type packets and are obtained from the receiver-side retransmission control part to decompress the original packet,

the receiver-side retransmission control part generates a retransmission request control signal to indicate a data unit requested to be retransmitted to another packet transmitting/receiving apparatus communicating with the packet transmitting/receiving apparatus,

the scheduling part performs a scheduling process on the retransmission request control signals with the data unit to be transmitted,

the transmitting part further comprises the classifying part for classifying and outputting the retransmission request control signals transmitted from the opposing packet transmitting/receiving apparatus into the transmitter-side retransmission control part, and

the transmitter-side retransmission control part outputs to the scheduling part the data unit indicated by the retransmission request control signal transmitted from the opposing packet transmitting/receiving apparatus upon the retransmission request control signal being input.

16. The packet transmitting/receiving apparatus as claimed in claim 15, wherein:

the transmitting part further comprises a header compressing part for applying a header compression process in a predetermined manner to the packet to be transmitted;

the receiving part further comprises a header decompression part;

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units;

the assembling part applies the assembling process to the plurality of the predetermined data units to decompress the header-compressed packet; and

the header decompression part applies a header decompression process corresponding to the header compression process in the header compressing part to the header-compressed packet obtained from the assembling part to decompress the original packet.

17. A packet transmitting/receiving apparatus comprising a transmitting part and a receiving part for transmitting and receiving packets classified according to a QoS requirement respectively, wherein,

the transmitting part comprises:

a first scheduling part for determining transmission order for packets to be transmitted;

a dividing part provided for each QoS class for dividing the packets to be transmitted of which transmission order is determined by the first

scheduling part into a plurality of predetermined data units in each QoS class;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process in each QoS class to the data unit that belongs to one of QoS classes specified for data type packets and is one of the data units obtained from the dividing part; and

a scheduling part for selecting a data unit to be transmitted from a set of data units including a data unit that belongs to one of QoS classes not specified for data type packets and is obtained from the dividing part, and a data unit that belongs to one of the QoS classes specified for data type packets and is obtained from the transmitter-side retransmission control part, according to the QoS requirement, and transmitting the selected data unit,

the receiving part comprises:

a receiver-side retransmission control part for applying a receiver-side retransmission control process in each QoS class to the data unit that belongs to one of the QoS classes specified for data type packets and is one of the received data units;

an assembling part for assembling in each QoS class the data units that belong to one of the QoS classes not specified for data type packets and are some of the received data units, and the data units that belong to one of the QoS classes specified for data type packets and are obtained from the receiver-side retransmission control part to decompress the original packet,

the receiver-side retransmission control part generates a retransmission request control signal to indicate a data unit requested to be retransmitted to another packet

transmitting/receiving apparatus communicating with the packet transmitting/receiving apparatus,

the scheduling part performs a scheduling process on the retransmission request control signals with the data unit to be transmitted,

the transmitting part further comprises:

the classifying part for classifying and outputting the retransmission request control signals transmitted from the opposing packet transmitting/receiving apparatus into the transmitter-side retransmission control part, and

the transmitter-side retransmission control part outputs to the scheduling part the data unit indicated by the retransmission request control signal transmitted from the opposing packet transmitting/receiving apparatus upon the retransmission request control signal being input.

18. The packet transmitting/receiving apparatus as claimed in claim 17, wherein:

the transmitting part further comprises a header compressing part for applying a header compression process in a predetermined manner to the packet to be transmitted;

the receiving part further comprises a header decompression part;

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units;

the assembling part applies the assembling process to the plurality of the predetermined data units to decompress the header-compressed packet; and

the header decompression part applies a header decompression process corresponding to the header compression process in the header compressing part to the header-compressed packet obtained from the assembling part to decompress the original packet.

19. A packet transmitting apparatus for transmitting packets classified according to a QoS requirement, the packet transmitting apparatus comprising:

a dividing part provided for each QoS class for dividing a packet to be transmitted into a plurality of predetermined data units in each QoS class;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process in each QoS class to the data unit that belongs to one of QoS classes specified for data type packets and is one of the data units obtained from the dividing part; and

a scheduling part for selecting a data unit to be transmitted from a set of data units including a data unit that belongs to one of QoS classes not specified for data type packets and is obtained from the dividing part, and a data unit that belongs to one of the QoS classes specified for data type packets and is obtained from the transmitter-side retransmission control part, and transmitting the selected data unit.

20. The packet transmitting apparatus as claimed in claim 19, wherein:

the packet transmitting apparatus further comprises a header compressing part for applying a header compression process in a predetermined manner to the packet to be transmitted; and

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units.

21. A packet transmitting apparatus for transmitting packets classified according to a QoS requirement, the packet transmitting apparatus comprising:

a first pre-scheduling part for selecting classes having high priority for transmission from QoS classes specified for data type packets;

a second pre-scheduling part for selecting classes having high priority for transmission from QoS classes not specified for data type packets;

a first dividing part for dividing a queued packet to be transmitted belonging to the QoS class selected by the first pre-scheduling part into a plurality of predetermined data units;

a second dividing part for dividing a queued packet to be transmitted belonging to the QoS class selected by the second pre-scheduling part into a plurality of the predetermined data units;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process to the packet to be transmitted to be divided by the first dividing part; and

a scheduling part for selecting either one

of the QoS classes specified for data type packets or one of the QoS classes not specified for data type packets to be transmitted, transmitting the data unit obtained from the transmitter-side retransmission control part when the QoS class specified for data type packets is selected, and transmitting the data unit obtained from the second dividing part when the QoS class not specified for data type packets is selected.

22. The packet transmitting apparatus as claimed in claim 21, wherein:

the packet transmitting apparatus further comprises a header compressing part for applying a header compression process in a predetermined manner to the packet to be transmitted;

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units.

23. A packet transmitting apparatus for transmitting packets classified according to a QoS requirement, the packet transmitting apparatus comprising:

a first scheduling part for determining transmission order for packets to be transmitted;

a dividing part provided for each QoS class for dividing the packets to be transmitted of which transmission order is determined by the first scheduling part into a plurality of predetermined

data units in each QoS class;

a transmitter-side retransmission control part for applying a transmitter-side retransmission control process in each QoS class to the data unit that belongs to one of QoS classes specified for data type packets and is one of the data units obtained from the dividing part; and

a scheduling part for selecting a data unit to be transmitted from a set of data units including a data unit that belongs to one of QoS classes not specified for data type packets and is obtained from the dividing part, and a data unit that belongs to one of the QoS classes specified for data type packets and is obtained from the transmitter-side retransmission control part, according to the QoS requirement, and transmitting the selected data unit.

24. The packet transmitting apparatus as claimed in claim 23, wherein:

the packet transmitting apparatus further comprises a header compressing part for applying a header compression process in a predetermined manner to the packet to be transmitted;

the dividing part divides a header-compressed packet obtained from the header compressing part into a plurality of the predetermined data units.

25. A packet receiving apparatus for receiving packets classified according to a QoS

requirement in the form of predetermined data units into which the packets are divided, the packet receiving apparatus comprising:

a receiver-side retransmission control part for applying a receiver-side retransmission control process in each QoS class to the data unit that belongs to one of the QoS classes specified for data type packets and is one of the received data units;

an assembling part for assembling in each QoS class the data units that belong to one of the QoS classes not specified for data type packets and are some of the received data units, and the data units that belong to one of the QoS classes specified for data type packets and are obtained from the receiver-side retransmission control part to decompress the original packet.

26. A packet receiving apparatus for receiving packets classified according to QoS requirement in the form of predetermined data units into which the packets are processed for header compression and divided, the packet receiving apparatus comprising:

a receiver-side retransmission control part for applying a receiver-side retransmission control process in each QoS class to the data unit that belongs to one of the QoS classes specified for data type packets and is one of the received data units;

an assembling part for assembling in each QoS class the data units that belong to one of the QoS classes not specified for data type packets and are some of the received data units, and the data

units that belong to one of the QoS classes specified for data type packets and are obtained from the receiver-side retransmission control part to decompress the header-compressed packet; and

a header decompression part for applying a header decompression process to the header-compressed packet obtained from the assembling part to decompress the original packet.